

AMENDMENTS TO THE SPECIFICATION

Page 1, please amend the paragraph that begins on line 7 as follows:

The wheel for vehicles, for example automobiles, is configured with a disk portion to which an axle is joined and a rim portion to which a tire is fit. The wheel is made of steel or aluminum. In recent years, the wheel for vehicles is increasingly required to have external appearance design characteristics ~~of appearance characteristic of external appearance design~~ in addition to mechanical characteristics such as strength, steering stability, and lightweight. This has led aluminum wheels to the mainstream because they can be produced as a single component by casting and have high degree of freedom in appearance and form.

Page 2, please amend the paragraph that begins on line 12 as follows:

When a vehicle such as an automobile is running, the wheels of the vehicle are to receive external forces such as loads and bending moments radially from outside through the disk radial portion of the wheel formed between the rim portion and the hub attachment portion where the axle is joined. Therefore, the disk radial portion, when driving, repeats elastic deformation and vibrates due to such external forces. Here, in case of a vehicle wheel configured with a steel or aluminum wheel base unit provided with a cover made of plastic such as ABS, not only the disk radial portion repeats elastic deformation and vibrates when driving as described above, but also the cover vibrates due to loads and deformation transmitted from the wheel base unit. The vibration of the wheel base unit is different in characteristics such as amplitude and intensity from the vibration of the cover due to differences in material, modulus of elasticity, and natural frequency. As a result, the vibrations of both components cause repeated colliding actions between the cover and the wheel base unit as they collide with and part from each other. Abnormal sound[[,]] and noise[[,]] produced by the colliding actions is a problem associated with the running wheel. Also here, if the wheel base unit and the cover are made to contact each other without a gap, the colliding actions become remarkable by the vibrations of the wheel base unit and the cover and produce large noise when traveling.

This invention relates to a vehicle wheel having a wheel base unit made up of a disk portion and a rim portion, with a cover placed to cover the wheel base unit from its outside, characterized in that the cover has easily deformable narrow spoke portions for partially covering a disk radial portion interconnecting the hub attachment portion of the disk portion to be joined to an axle and the rim portion and that a design surface is constituted with the outside of the easily deformable narrow spoke portions and the exposed outside surface of the disk radial portion. The easily deformable narrow spoke portion of the cover is provided with a relatively thin, easily deformable part for covering the approximately middle part of the disk radial portion. Here, "exposed outside surface" of the disk radial portion refers to part of the disk radial portion that is not covered with the easily deformable narrow spoke portions and is exposed outside. Besides, the side of the vehicle wheel that faces outward of the vehicle when attached to the vehicle becomes the design surface of the wheel.

With the above constitution, the easily deformable narrow spoke portions are made in a slender shape to have a small covering area for partially covering the disk radial portion of the wheel base unit, so that they are low in rigidity and easily deformable in comparison with the disk radial portion. Therefore, with the vehicle wheel of this invention, the easily deformable narrow spoke portions of the cover deform due to external forces that they receive when traveling such as radial loads, circumferential loads, torsional forces, and bending moments, and follow the elastic deformation of the disk radial portion that is higher in rigidity than the easily deformable narrow spoke portions. The difference in vibration characteristic between the disk radial portion and the easily deformable narrow spoke portions becomes small. The repeated colliding actions, or butting action, between the cover and the wheel base unit caused by the vibrations of both the components decrease, so that it is possible to reduce noise. It is further possible to reduce frictional actions

between the easily deformable narrow spoke portions and the disk radial portion produced with torsional vibration and radial wobble that the wheel receives when traveling and to reduce noise produced with the frictional actions. Incidentally, in case of a cover made of a material that is lower in modulus of elasticity than the wheel base unit, because the easily deformable narrow spoke portions are ~~further~~ even lower in rigidity than the disk radial portion, the easily deformable narrow spoke portions deform ~~further well~~ better to follow the elastic deformation of the disk radial portion.

Page 6, please amend the paragraph that begins with “Because the wheel base unit...” on as follows:

Because the wheel base unit of the above type of vehicle wheel has a relatively [[a]] large externally exposed area, heat radiating characteristic of the wheel can be enhanced and cooling characteristic of the brake and the like[[.]] is also enhanced. Furthermore, because the design surface is constituted by merger of the wheel base unit and the cover, it is less necessary to make the wheel base unit and the cover in complicated external shapes. Therefore, it is advantageous in the manufacture of the wheel base unit and the cover because the constitution of dies is simplified and related costs are reduced, and manufacturing process can be made ~~further~~ more efficient.

Page 7, please amend the paragraph that begins with “As for the above vehicle wheel ...” on as follows:

As for the above vehicle wheel, a constitution is proposed in which the easily deformable narrow spoke portions of the cover have an inside surface shape that comes in tight, even contact with the covered surface on the outer side of the disk radial portion covered with the easily deformable narrow spoke portions. Because the border between the easily deformable narrow spoke portions and the disk radial portion is visibly recognizable, a gap if present at the border may detract from design beauty. Therefore, causing tight contact between the covered surface of the disk radial portion and the easily deformable narrow spoke portions almost without a gap makes it possible to improve the appearance of the border and the design characteristic of the wheel. Incidentally, it is possible to bring the easily deformable narrow spoke portions and the disk radial portion into

Page 8, please amend the paragraph that begins with “The vehicle wheel with ...” on as follows:

Page 8, please amend the paragraph that begins with “Here, it is possible to make ...” on as follows:

Page 8, please amend the paragraph that begins with “It is also proposed here ...” on as follows:

Page 13, please amend the paragraph that begins with “In this embodiment as described ...” on as follows:

Page 15, please amend the paragraph that begins with “As described above, it is possible ...” on as follows:

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Page 18, please amend the paragraph that begins with “Because the design surface ...” on as follows:

Page 18, please amend the paragraph that begins with “As described above, this embodiment ...” on as follows:

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portion 20 as a whole can fulfill its function. Here, the thin shape of the easily deformable part 20a may be realized by, besides lowering the side walls of the U-shape cross section as described above, reducing the wall thickness of each wall constituting the U-shape cross section, or widening the distance between the side walls of the U-shape cross section.

Page 19, please amend the paragraph that begins with "The cover 3 according to the ..." on as follows:

The cover 3 according to the above embodiment is constituted in that the peripheral attachment lug 30 and the hole attachment lug 32 are respectively made to engage with the inside circumferential recess of the hump portion 19 and the opening edge 40 of the hub hole 6 of the wheel base unit 2. Another cover 3' of a different constitution may also be made as shown in FIG. 8 in which a hole seat surface 36 is formed on the radially outer side of the hub hole covering portion 22 between a pair of the easily deformable narrow spoke portions 20, 20, with the hole seat surface 36 bored with a cover holding hole 35 communicated with the bolt hole 8 of the wheel base unit 2. The cover 3' is formed like the above embodiment with the peripheral attachment lug 30 (not shown in FIG. 8). To attach the cover 3', the cover holding hole 35 is aligned with the bolt hole 8 as shown in FIG. 9 and the peripheral attachment lug 30 is made to engage with the inside circumferential recess of the hump portion 19. When the vehicle wheel 1' with the cover 3' is installed to an automobile, a bolt (not shown) projecting from the hub of the automobile projects from the inside of the wheel 1' to the outside of the cover holding hole 35. Then the bolt is tightened to the hole seat surface 36 using a specified nut 38. In this way, the vehicle wheel 1' is secured to the axle, the cover 3' is secured to the wheel base unit 2, and the side edge 26 of the easily deformable narrow spoke portion 20 comes into tight contact with the covered surface 25 of the disk radial portion 7. Also the above constitution, like the above embodiment, can display excellent design characteristic and low noise characteristic.

Page 20, please amend the paragraph that begins with “The above embodiment ...” on as follows:

The above embodiment is constituted with the wheel base unit 2 to which is attached the cover 3 having the pair of easily deformable narrow spoke portions 20, 20 for covering both side areas of the disk radial portion 7. Another vehicle wheel 51 of a different constitution may also be made as shown in FIG. 10 in which a cover 53 having easily deformable narrow spoke portions 50 is attached to a wheel base unit 52, with the easily deformable narrow spoke portion 50 covering the central area (covered surface) extending in the radial direction of the disk radial portion 57 of the wheel base unit 52. The easily deformable narrow spoke portion 50 here, like the above embodiment, is formed with an easily deformable part ~~56~~50a in about the middle of the disk radial portion 57. Also such vehicle wheel 51, like that of the above embodiment, shows superior design characteristic and low noise characteristic.